

## ABSTRACT OF THE DISCLOSURE

Techniques for performing multistage processing with feedback include a multi-stage feedback processor comprising a first plurality of processing stages connected in series. A feedback channel connects a last stage to one of the other stages. Each processing stage is 5 configured to process one block of data from a data stream during one processing cycle. A parallel input queue includes a second plurality of input queues connected in parallel to the first stage. The parallel input queue directs a block to the first stage alternately from each of a third plurality of data streams. In an embodiment, the number of data streams is no greater than the number of input queues. This arrangement significantly improves throughput for 10 multistage processing with feedback. The arrangement is suitable for encryption and decryption of network traffic using block-based symmetric ciphers.